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rake, and a cylinder of galvanized sheet-iron, thirty inches long by eleven inches in diameter, containing an elongate, tapering strainer, and supported in an iron framework having six runners of round iron at equal distances apart. The mouth is furnished with a short conical strainer of coarse wire netting projecting from the front, and a funnel-shaped collar of sheet-iron opening inwards. This dredge is designed for collecting the small, unattached forms of marine animals living upon smooth bottoms,

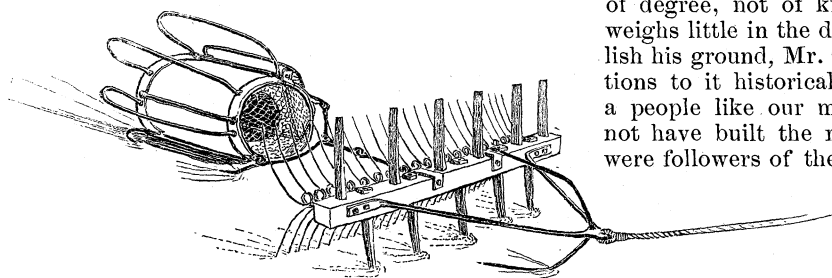


FIG. 10. — BENEDICT'S RAKE-DREDGE.

which are crushed or lost sight of in the ordinary dredges and trawls. The rake is intended to give the bottom-materials a thorough stirring up, so as to dislodge the animals, which, together with the sediment, come in contact with the nose-piece of the cylinder, only those below a certain size being able to pass in. This appliance has proved very effective in collecting in perfect condition many delicate species of animals which had previously been seldom obtained in suitable shape for study, and at the recent London fisheries exhibition it elicited much favorable comment from European naturalists.

RICHARD RATHBUN.

THE ORIGIN OF THE OHIO MOUNDS.

The mounds of the Mississippi valley historically considered. By LUCIEN CARR, assistant curator of the Peabody museum of American archaeology. [From vol. ii. of the *Memoirs of the Kentucky geological survey*. N. S. Shaler, director.] 1883. 109 p. 4°.

THE thesis which Mr. Carr has to defend in this elaborate paper is that the red Indian, as he is known historically, and without implying any lapse from a higher condition of life than he now occupies, was quite capable of building the mounds of the Mississippi valley. As we have no positive proof of what the people were who did build them, and no record of the time of building, except inferentially in some cases

from the rings of trees, he claims that there is no necessity of supposing them the work of other folk than those found upon the spot by the whites at the first contact. Further, should, by any chance, evidence be found hereafter to fix the so-called mound-builder as another race, there is no ground to believe them to be higher in the social scale than the red Indian of historic times. He admits that in size the Ohio mounds, in some cases, exceed those which the Indian is actually known to have built in recent times; but in his opinion the difference is one

of degree, not of kind, and accordingly weighs little in the discussion. To establish his ground, Mr. Carr meets the objections to it historically. It is urged that a people like our modern Indians could not have built the mounds, because they were followers of the chase, and not agriculturists; and without being agriculturists they could not have supplied the subsistence for the large

number of men necessary to erect these mounds. There are two ways of answering this proposition. One is by asserting that there is no evidence that the building was done in such a way as to require much labor in a short time; while it may be believed that the labor was extended over a long time, and hence required few workers at any one time. This answer Mr. Carr ignores. The other reply is, that it is an unfounded assumption to affirm that the red Indian was not an agriculturist, when it is susceptible of proof that he not only supplied from the fields daily wants, but laid in store for unfruitful years and for barter. This position Mr. Carr abundantly sustains from the older writers.

The second proposition which he meets sets forth the so-called mound-builders as worshippers of the sun, and their structures as inferentially allied with that cult; while the Indian is not and was not such a worshipper. His answer to this is, that the red Indian is, and particularly was, a sun-worshipper; and this he establishes satisfactorily from the early chroniclers. Further, it is a mere assumption, in his opinion, to call a certain class of these mounds religious while there is no proof of it. The truth seems to be, that designations of convenience have grown to be arguments obscuring the question.

Having thus in two sections of his paper proved that the Indian could have built such

works if he would, Mr. Carr next undertakes to show that the Indian is known within historic times to have built similar though smaller works. Arraying a mass of testimony from the old and even later writers, sufficient in quality and quantity, he succeeds in doing this.

There is one natural objection to his conclusion. While some, or most it may be, of existing mounds should be traced to early generations of the red Indian, or of races on his plane, he does not admit that it is supposable that another race, possibly of higher grade, may have built other of the mounds.

We suspect that the truth of this last proposition is to rest on other investigations than Mr. Carr has yet touched. Manifestly, that the Indian could have built the mounds does not prove that he did; and, even if it be proved that some of the mounds in question can be directly traced to him, it does not follow that others may not have been built by a different people, since mound-building cannot be confined historically to any single people or any single continent.

Perhaps Mr. Carr has thrown the burden of proof upon the opposers of his theory, since it may be fair to argue that there is no necessity of supposing another race to account for the mounds. Granting that Mr. Carr establishes his point from the external evidences of the mounds, there yet remains a test for his theory in the contents of the mounds. Mr. Carr acknowledges this shortcoming of his argument, and promises in due time to examine the question from the testimony of the skulls and relics of workmanship, as well as from evidences of parallel custom, which can be drawn from the records of the exploration of the mounds. These, it seems to us, are to be the final tests. It is clear that history cannot settle the question, but archeological investigations may. We suspect that Mr. Carr wrongly estimates the comparative value of the two methods in a question of this kind. He says that the investigators who have given rise to the views which he combats have been "practical explorers, who have brought to the investigation a certain number of facts, chiefly cumulative in character, and who have not as a rule been possessed of that measure of historical information which is necessary to a correct interpretation of these facts." It is indisputable that the historical evidence accumulated by Mr. Carr may be helpful; but the fact still remains, that this evidence must be viewed in the light of the archeological results. It may be safe to grant all that these historical evi-

dences prove; but arguments respecting the origin of the mounds, based on them, become inferential, and may or may not accord with the archeological demonstrations. There can be no question which is to be the ultimate tribunal.

SIDGWICK ON FALLACIES.

Fallacies: a view of logic from the practical side.

By ALFRED SIDGWICK, Berkeley fellow of the Owens college, Manchester. New York, Appleton, 1884. (International scientific series.) 16+375 p. 16°.

It does not often fall to the lot of a reviewer to find so little to praise in a book by so clever a writer and clear-headed a logician as the author of the treatise on fallacies, which has appeared in the International scientific series. What most obviously calls for complaint is its want of adaptation to the main purpose for which, by its publication in this series, and by the explicit avowal of the author in his preface, it seems to have been designed; namely, to be of profit to the general reader. No reader who has not become familiar with the technical language of logicians, and even with many phases of logical controversy, is at all likely to follow our author with sufficient interest to so much as comprehend what he is talking about, much less to carry away a clear and lasting impression of important truths. Not that much knowledge of logic is presupposed; but the discussion is so full of abstractions and subtleties, of nice distinctions which we are presently told are no distinctions at all, and identifications of things we had supposed very unlike and which we are presently told we would better keep apart as of old, that if we add to the intangibility of such questions the difficulty, for novices in logic, of promptly seizing the precise force of the terms which are necessarily employed, we cannot expect any very valuable results from their perusal of the book before us.

But, in point of fact, it is not to tyros only that the book will be a disappointment. There is much balancing of views on nice points of language, and every now and then a most refreshing bit of sarcasm, for our author has a keen eye for all sorts of logical weakness; and there is often plain talk about the practical limitations to which we are subject in the search for truth. But there is an extraordinary absence of decision and concentrated statement, — qualities indispensable to the success of a work of this kind. On almost every point the author comes to the conclusion that little or nothing which is useful can be said about it. With